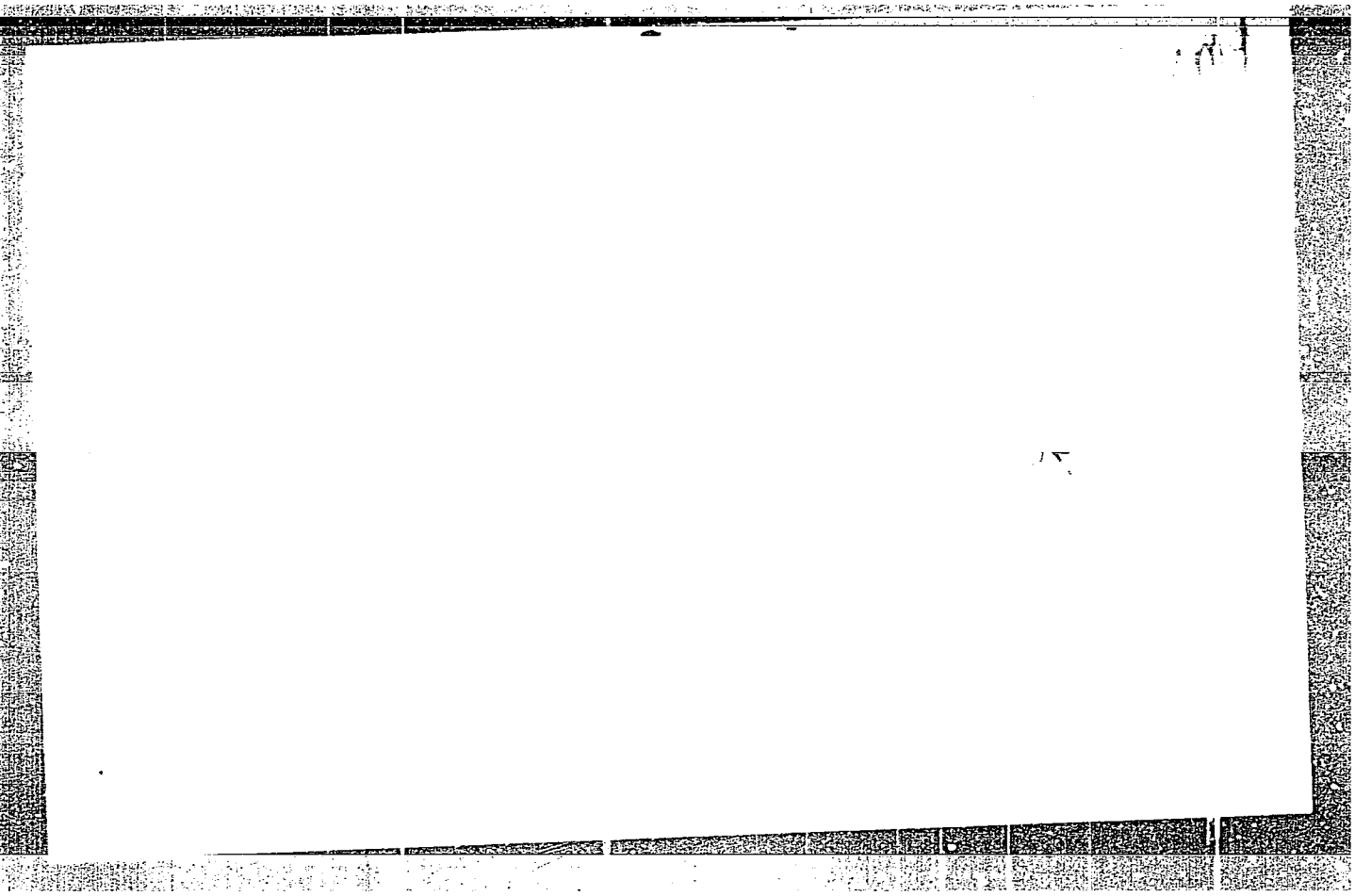

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R001858610015-6"

VARFOLOMEYEV, A.A.

USSR/Nuclear Physics - Installations and Instruments. Methods of Measurement and Research. C-2

Abs Jour : Ref Zhur - Fizika, No 4, 1957, 8598

Author : Alpers, V.V., Varfolomeyev, A.A.

Inst :

Title : Emulsion Camera

Orig Pub : Pribory i tekhn. eksperimenta, 1956, No 1, 28-32

Abstract : Description of a procedure for preparing and using packets of emulsion layers as a solid emulsion camera for the recording of charged particles. The construction of a camera made of round emulsion layers 10 cm in diameter is described, and the method of photographic treatment of the layers and the gluing them on glass after processing is described, along with the method for tracing the trajectories of the particles through the packet by means of a coordinate grid drawn on the camera by X-rays.

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VARFOLOMEYEV, A.A.

C-3

USSR/Nuclear Physics - Elementary Particles.

Abs Jour : Ref Zhur - Fizika, No 4, 1957, 8641

Author : Varfolomeyev, A.A., Gerasimova, R.I., Zamchalova, Ye.A., Podgoretskiy, M.I., Shcherbakova, M.N.

Inst : Academy of Sciences, USSR.

Title : Energy Spectrum of Negative Pions, Formed by Cosmic Rays in a Photo Emulsion.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 6, 1164-1166.

Abstract : The authors give the energy spectra obtained for 195 positive and 328 negative pions, generated in the R-5 emulsion (emulsions 330 and 450 mecrons thick, 10 cm in diameter), exposed to cosmic rays in the stratosphere. Corrections are made to the obtained data to take into account the finite dimensions of the emulsion blocks.. The author believes ti possible that in the negative pion spectrum, in the range of 10 -- 30 Mev, there is a small maximum which in their opinion can be interpreted as the decay of Λ^0

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USSR/Nuclear Physics - Elementary Particles. C-3

Abs Jour : Ref Zhur - Fizika, No 4, 1957, 8641

particles, absorbed by the same nucleus. The shift in the position of the maximum can be explained by the fact that the Λ^0 particle may turn out to be a lower energy level than the least bound neutron, and also by the slowing down of the negative pion in the Coulomb field of the nucleus.

Card 2/2

VARFOLOMEYEV, A.A.

USSR/Nuclear Physics - Elementary Particles. C-3

Abs Jour : Ref Zhur - Fizika, No 4, 1957, 8634

Author : Varfolomeyev, A.A., Gerasimova, R.I.
Inst : Academy of Sciences, USSR.
Title : Disintegration of Beryllium and Carbon Nuclei as a Result of π^- -Meson Capture.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 6, 1166-1167.

Abstract : Seven cases were observed of the absorption of π^--mesons in microcrystals of beryllium and 12 cases of absorption in microcrystals of carbon, introduced into the photographic emulsion. The characteristic feature of the above σ - stars is the absence of tritons with energies greater than 10 Mev, and the fact that the mean energy of the emitted protons does not exceed 10 Mev. In the author's opinion, the above data are evidence that in the primary act a greater portion of the rest energy of the π^--meson is received by 1 -- 2 neutrons which do not experience secondary collisions in such light nuclei, as beryllium and carbon.

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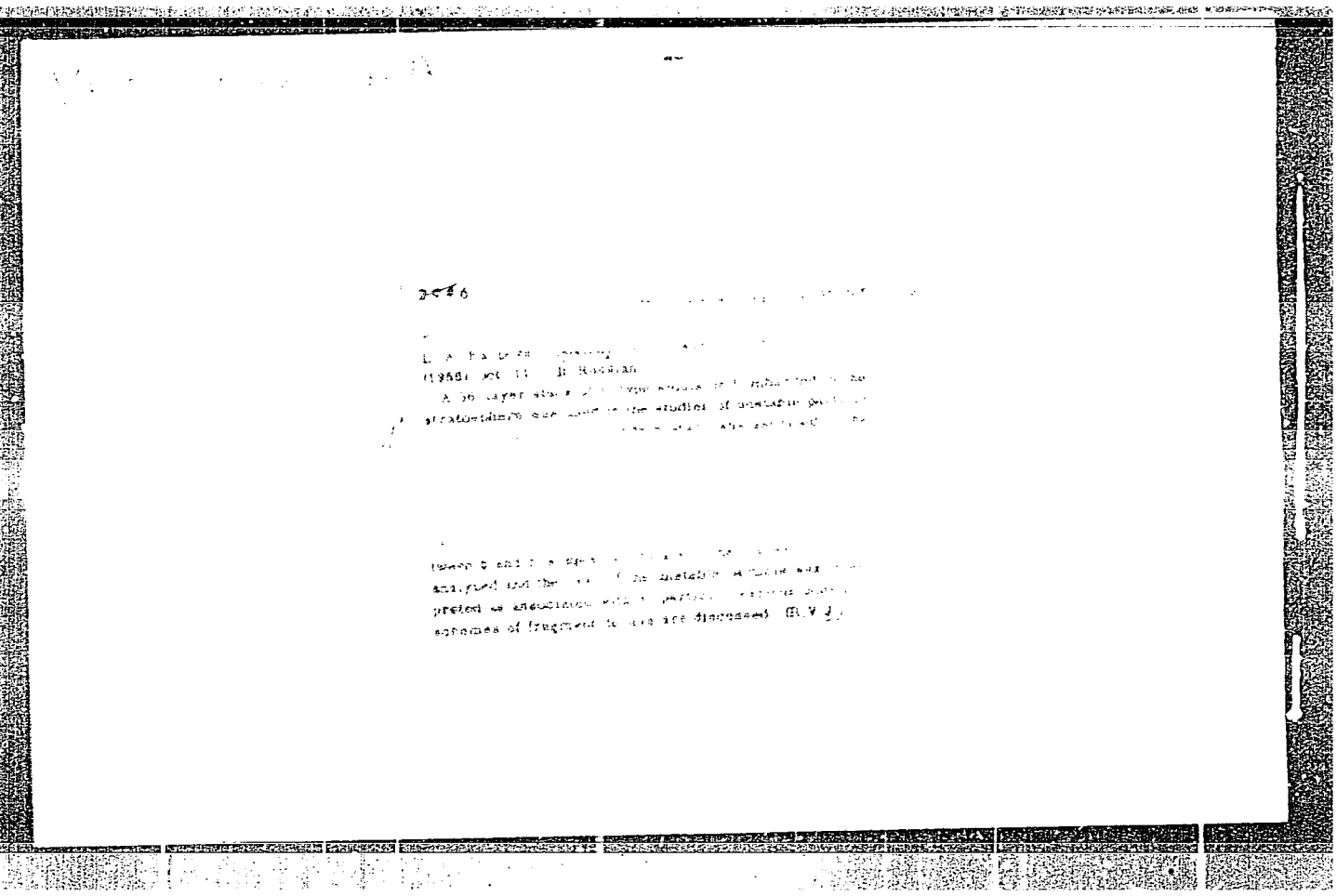
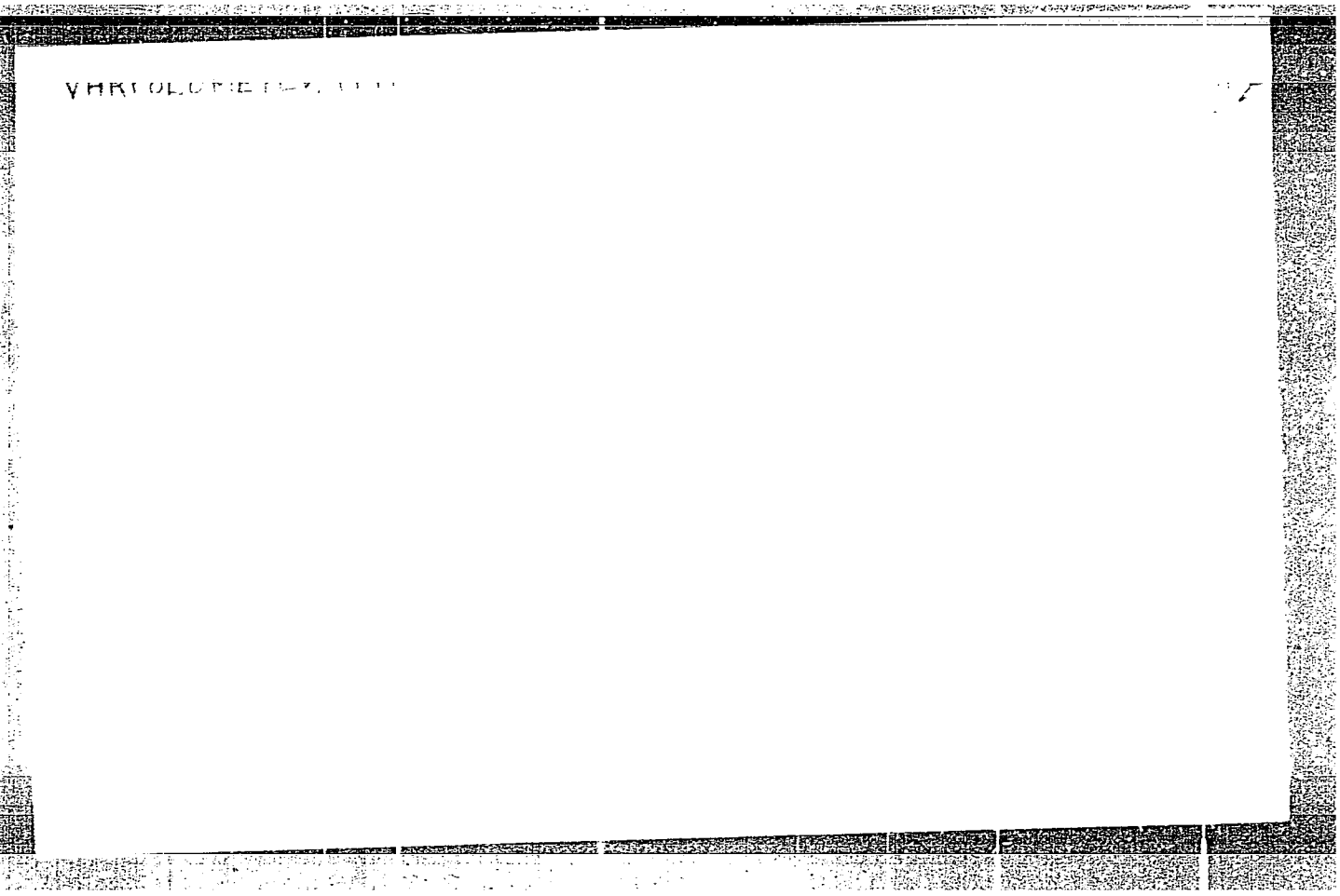
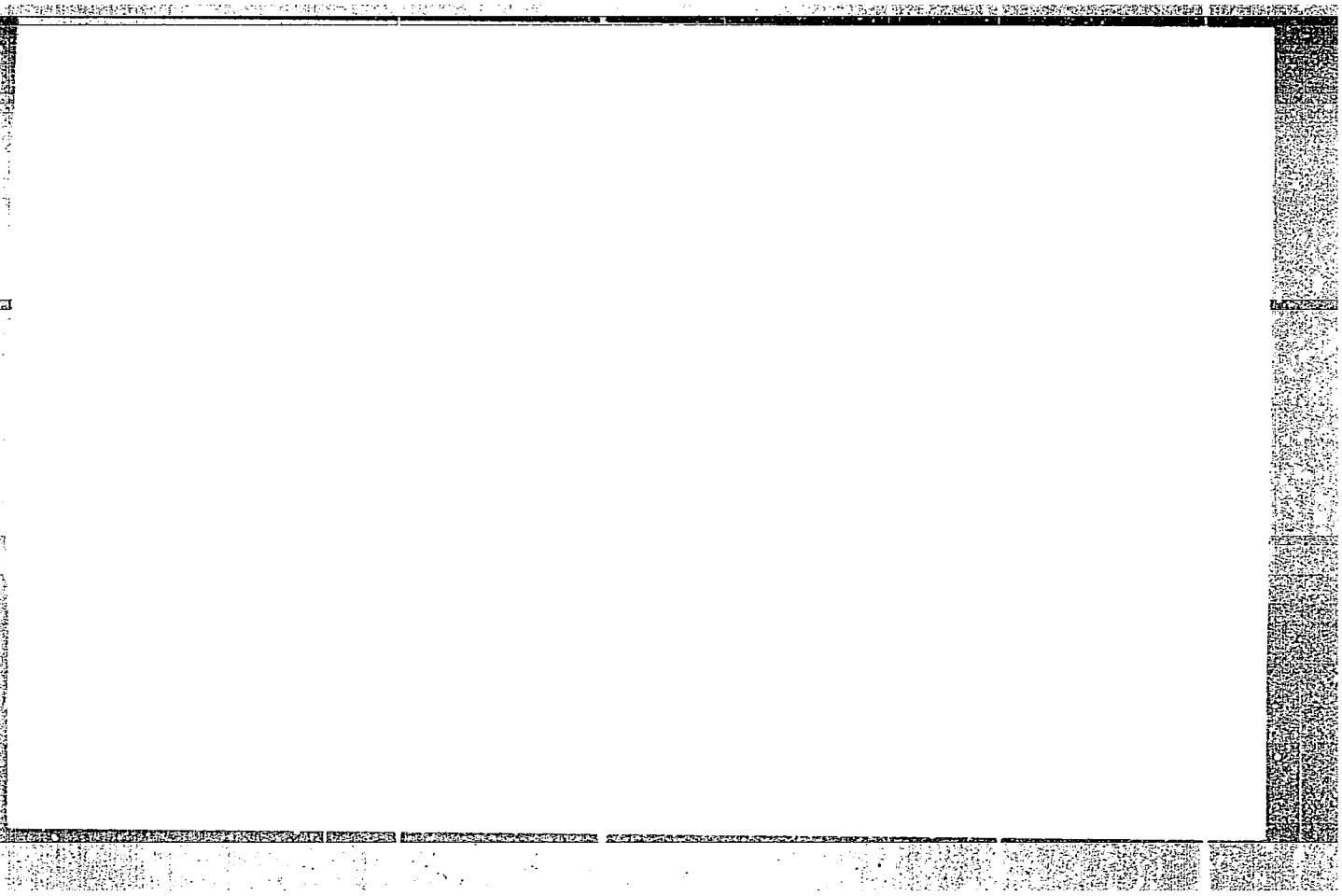






APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R001858610015-6"

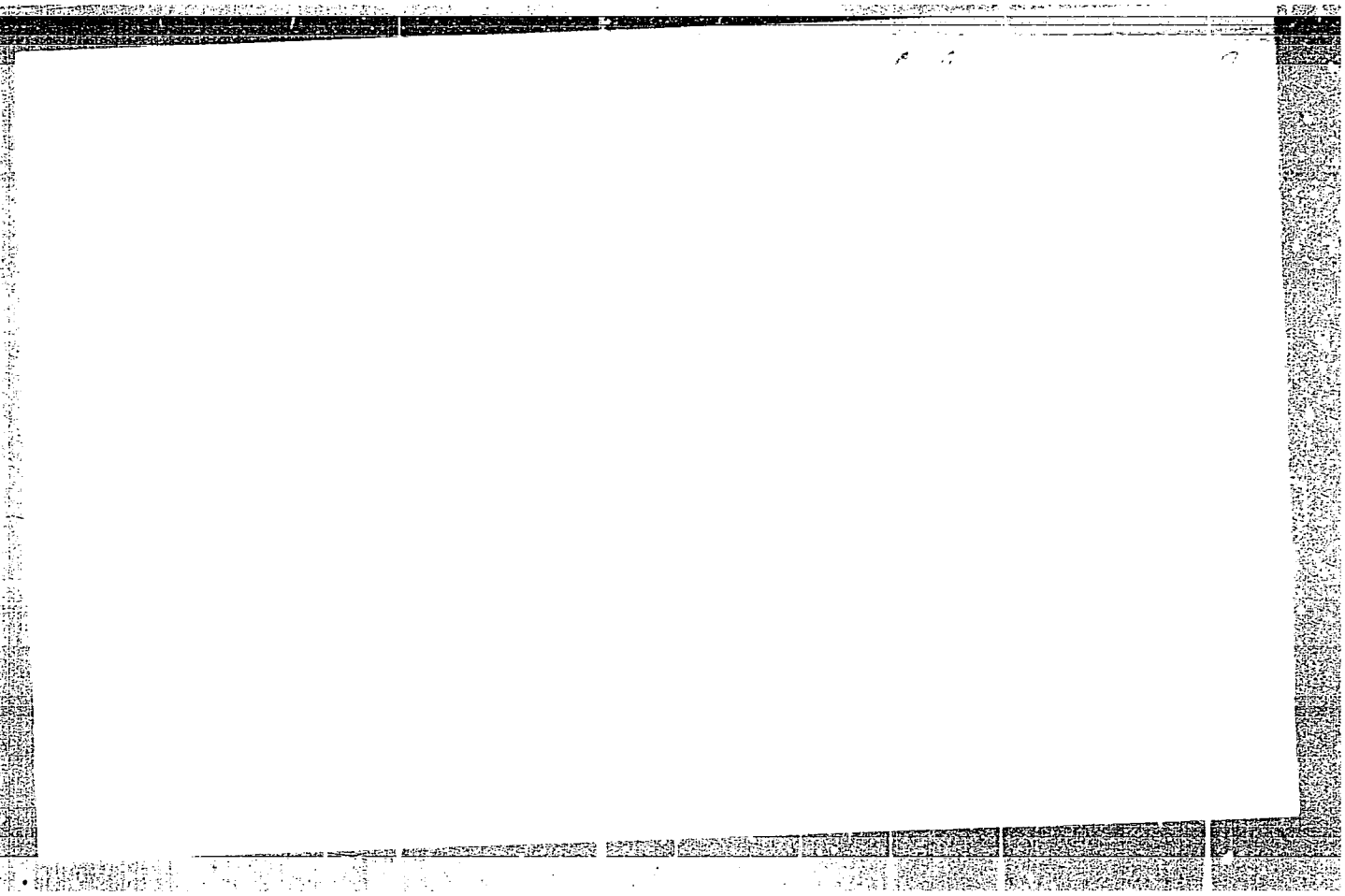
VARFOLOMEYEV, A.A.

INSTRUMENTATION: NUCLEAR PHOTOEMULSIONS

"International Conference on Photoemulsion Procedures, Dubna, 1957", by A.A. Varfolomeyev, Pribory i Tekhnika Eksperimenta, No 2, March-April 1957, pp 121-124.

Report on a conference held in Dubna from 25 February to 2 March 1957, organized by the Joint Institute for Nuclear Research. Attending this conference, in addition to representatives of many institutes of the Soviet Union, were specialists and scientists from China, Korea, Mongolia, Poland Hungary, Rumania, Bulgaria, and East Germany. This article gives a concise listing of all of the papers delivered and the topics touched upon. The complete record of the conference will be published by the Joint Institute for Nuclear Research.

Card 1/1



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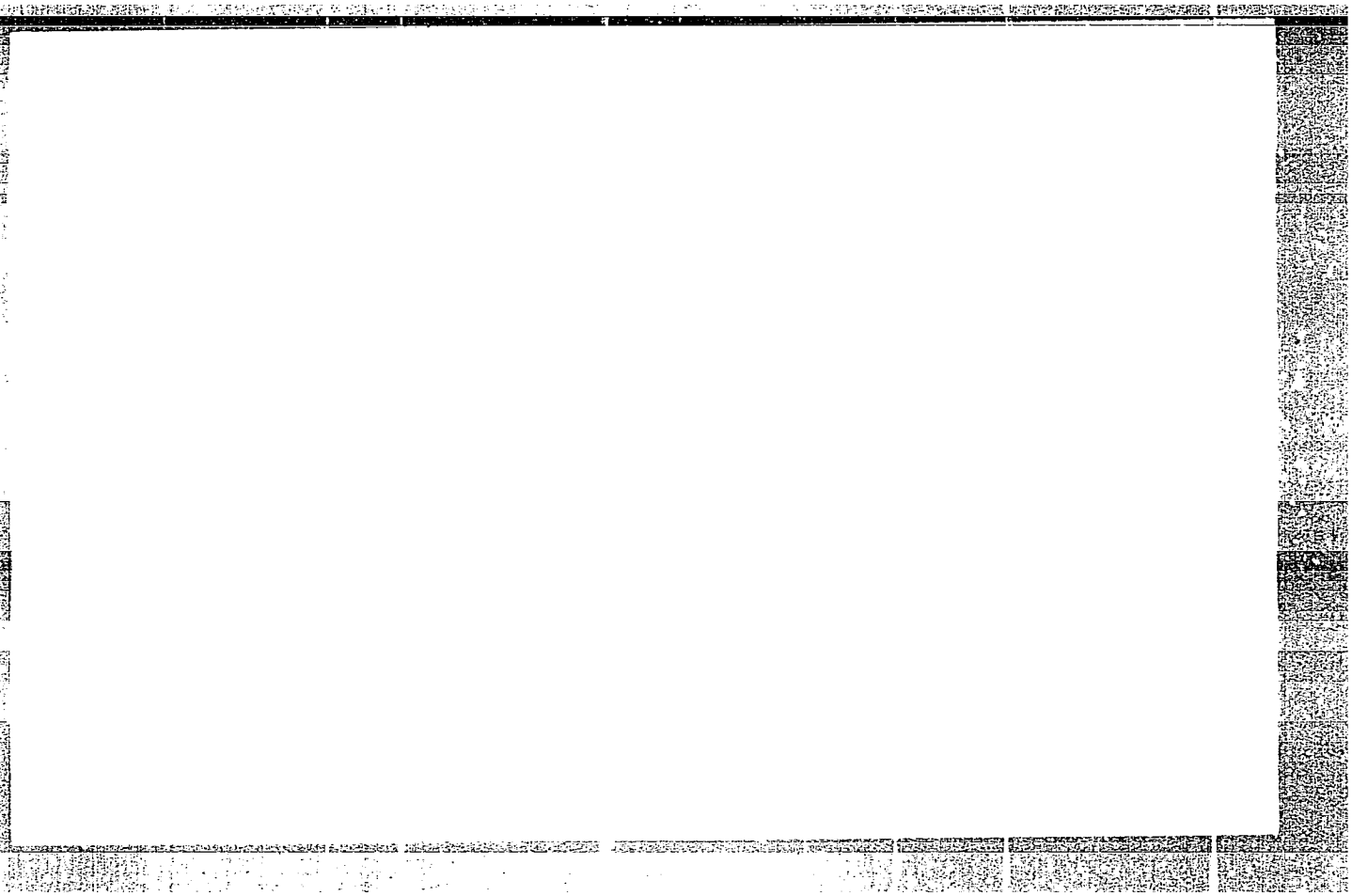

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R001858610015-6"

VARFOLOMEYEV, A.A.

56-5-5/55

AUTHOR VARFOLOMEYEV, A.A., GERASIMOVA, R.I., TUMANYAN, V.A.

TITLE Multiple Electron Production in a High Energy Electron-Photon Shower (Mnozhestvennoye obrazovaniye elektronov v elektronno-fotonnom livne bol'shoy energii. Russian)

PERIODICAL Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr5 , pp969 - 973 (U.S.S.R.)

ABSTRACT

In connection with the systematic investigation of electron-photon showers occuring in the nuclear emulsion layers in the stratosphere an unusual formation of showers was recorded. A 150 - layer plate of the emulsion "P" was used as photoplates. The thickness of a layer was about 400 μ and the plates had a diameter of 10 cm.

Exposure was carried out for about 10 hours in an altitude of about 20 - 24 km. The density of orbital traces in the emulsion was 37 grains per 100 μ in the case of a minimum of ionozation.

The unusual shower was caused by single electrons the path of which in the individual layers of the emulsion was $\sim$0,5 cm.

21 secondary electron-positron pairs were found, of which 12 had an energy of $\sim 10^8$ eV.

An exact analysis of these traces allows the conclusion that the primary electrons causing the effect had an energy of from 0,6 to $2;10^{12}$ eV.

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56-5-5/55

Multiple Electron Production in a High Energy Electron-Photon Shower

As a particular feature when analyzing the traces it was found that 6 electron-positron pairs always in couples occured and must therefore also have been formed simultaneously.

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Card 2/2

21(7)

AUTHORS: Varfolomeyev, A. A., Golenko, D. I., Svetlolobov, I. A.

SOV/2o-122-5-10/56

TITLE: The Characteristics of the Electromagnetic Cascades in a Photoemulsion With Consideration of the Influence of the Medium on the Radiation Processes (Kharakteristiki elektromagnitnykh kaskadov v fotoemul'sii s uchetom vliyaniya sredy na protsessy izlucheniya)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 5, pp 785 - 787 (USSR)

ABSTRACT: This paper gives the results of the calculations (carried out by means of the Monte-Carlo (Monte Karlo) method) of the electromagnetic cascades in a distance of up to 1.5 radiation units. These electromagnetic cascades are assumed to be produced by electrons of initial energies of 10^{11} and 10^{12} eV. These calculations were carried out by taking account of the real (not of the asymptotic) cross sections of the elementary electromagnetic processes

(as functions of the particle energies). Two variants of the calculations were carried out: In the first variant only the relations of Bethe (Bete) and Heitler (Gaytler) for the elementary processes were used, and in the second variant the formulae of A.B.Migdal (Ref 1) were used in order to take into account the influence exercised by the medium upon the radiation processes of the high energy electrons. The conditions of the cascade calculations are discussed in short. The cross sections of the elementary processes were calculated for the nuclear emulsions Ilford (Il'ford) G-5. Both of the above-mentioned variants gave the following results: 1) The energy spectra of the electron-positron pairs produced in depths of up to t_1 and t_2 respectively, for the initial energies of 10^{12} eV and 10^{11} eV. 2) The energy spectra of the electrons which reach the depths t_1 and t_2 for the

initial energies 10^{12} eV and 10^{11} eV respectively. 3) Various data which permit conclusions concerning the fluctuations of the results and concerning the dependence of the fluctuations on the investigated depth t, on the initial energy, and on the energy interval of the secondary particles. According to these results, the investigations of a few showers of the energy of 10^{12} eV supply definite arguments in favor of the investigated effects. In order to obtain the same amount of information, the investigation of a greater number of 10^{11} eV showers would be necessary. The results of this paper can be applied also to other media. The authors thank I.I.Gurevich for his interest in this paper and for discussing the results, and also I.P.Lavrushkin for his help in formulating the results. There are 3 figures, 1 table, and 4 references, 3 of which are Soviet.

The Characteristics of the Electromagnetic Cascades in a Photoemulsion With Consideration of the Influence of the Medium on the Radiation Processes SOV/20-122-5-10/56

PRESENTED: May 29, by I.V.Kurchatov, Academician

SUBMITTED: May 15, 1958

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VARFOLOMEYEV, A.A.

"CALCULATION OF CASCADES WITH ENERGIES FROM 10^9 to 10^{13} ev BY THE MONTE CARLO METHOD TAKING INTO CONSIDERATION THE INFLUENCE OF THE MEDIUM UPON BREMS-STRAHLUNG"

A.A. Varfolomeyev, I.A. Svetlolobov

The longitudinal development of electromagnetic cascades in neclear emulsion has been calculated at a depth up to 2.8t0 for primary electron energies from 10^9 to 10^{13} ev. The calculation was carried out by the Monte Carlo method using the "Strela" electronic computer.

In the calculations, use was made of the actual (not asymptotic) cross sections of the following elementary processes in the field of the nuclei and electrons all the emulsion components: Bermsstrahlung, production of pars by photons and electrons, Compton-effect, and ionization losses.

report presented at the International Cosmic Ray Conference, Moscow 6-11 July 1959

VARFOLOMEYEV, A.A.

"DIRECT PRODUCTION OF ELECTRON-POSITRON PAIRS BY HIGH ENERGY ELECTRONS"
A.A.Varfolomeyev, R.I. Gerasimova, L.A. Makaryina, A.P.Mishakova, A1S. Romantseva, G.S. Stolyarova, V.A. Tumany, S. A. Chuyeva

The cross-section of direct production of electron-positron pairs by high energy electrons was measured experimentally. For this purpose, a study was made of isolation electron-photon cascades and the photon component of high energy nuclear interactions in emulsion stacks exposed to radiation in the stratosphere. In order to exclude spurious cases of direct pair production, which constitute the main difficulty in exprrimental measurement of the cross-section of such pairs, the calculation was carried out by the Monte Carlo method.

The calculation was made for three values of primary electron energy: lo; 100 and 1,000 Bev, taking into consideration two possible variants of the Bremsstrahlung spectrum: Bethe-Heitler and Migdal variants (Launder-Pomeranchik and Ter-Mikaelyan effects). A method for determining the energy of untra-relativistic electrons from the lateral distribution of the apexes of electron-positron pairs is suggested.

During the expreimental measurement of very high electron energies, certain possible sources of underestimation were eliminated.

The cross section of direct pair production by high energy electrons was found to be in agreement with Bhabha's calculation within the limits of experimental error.

report presented at the International Cosmic Ray Conference, Moscow 6-11 July 1959

VARFOLOMEYEV, A.A.

"ELECTRON-PHOTON CASCADES WITH ENERGIES FROM 10^{11} to 10^{13} ev IN NUCLEAR EMULSIONS"

A.A. Varfolomeyev, R.I. Gerasimova, I.I. Gurevich, I.A. Makaryina, A.S. Romantseva, S.S. Chuyeva

Fifteen electron-photon cascades with energies from 10^{11} to 10^{13} ev, recorded in six emulsion stacks with a total volume of 10 l, have been investigated.

The energies of the primary photons evoking the cascades were determined by the energy spectrum of the cascade electrons at a depth of 2.5 ÷ 3t_0 (t_0 rad. unit).

The grain density and the gap density were measured for the first pairs. In all the pairs with energies 3×10^{11} ev, a decrease in grain density at the apex caused by the screening effect was discovered.

The following experimental relation of the ionization losses of pair (1) was obtained:

where I_{pe} is the specific ionization electron loss at the ionization pleateau, x is the distance from the apex of the pair in cm, and E, is the energy of the photon which produced the pair.

The expression obtained for $I/2I_{pe}$ may be used to determine the E energy from experimental values for I. An estimation of the E error is given, taking into consideration the screening effect.

The number of electron-position pairs produced at depths of 1.0t_0 and 1.5t_0 was measured.

VARFOLOMEYEV, A.A. (CONTINUED)

The results agree with the calculated data obtained by the Monte Carlo method, taking into account the effect of the medium on Bremsstrahlung (Landau-Pomeranchuk and Ter-Mikaelyan effects).

for 10 cascades with E 1.8x10^11 ev, the probability of P ( )^2 from the criterion 2, is 2.5 + 5% when compared with the curves which do not consider the effect of the medium, and 80-95% when compared with the calculations that take into consideration the effect of the medium on the Bremsstrahlung.

report presented at the International Cosmic Ray Conference, Moscow 6-11 July 1959

VARFOLOMEYEV, A.A., Cand Phys-Math Sci — (diss) "Effect of medium upon ~~the retardation radiation~~ bremsstrahlung in electron-photon showers with energies ~~voltage~~ of $10^{11} \div 10^{13}$ ~~ev~~ eV." Mos, 1959. 13 pp with graphs (Order of Lenin Inst of Atomic Energy of the Acad of Sci USSR). 101 copies. Printed on a duplicating machine. Bibliography at end of text (11 titles) (KL,38-59, 113)

31540
S/627/60/002/000/023/027
D299/D304

3.2410 (2205, 2705, 1559)

AUTHORS: Varfolomeyev, A. A., and Svetlolobov, I. A.

TITLE: Computing cascades with energies of 10^{11} - 10^{13} ev. by the Monte Carlo method with allowance for the influence of the medium on the bremsstrahlung

SOURCE: International Conference on Cosmic Radiation. Moscow, 1959. Trudy. v. 2. Shirokiye atmosfernyye livni i kaskadnyye protsessy, 292-298

TEXT: The calculations were carried out on the electronic computer "Strela" by the Monte Carlo method. The primary particles were electrons with energies $E_o = 10^9 - 10^{13}$ ev. The one-dimensional problem was considered, involving the following processes in the field of nuclei and electrons of the emulsion: bremsstrahlung, pair creation, the Compton effect, photonuclear absorption and ionization losses. The investigations were carried out for depths t ranging from 1.0 to 2.8. Two methods of calculation were used: The

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Computing cascades with ...

exact non-asymptotic Bethe-Heitler formulas for the effective cross-section of bremsstrahlung and pair creation, and Migdal's formula (Ref. 6: ZhETF, 32, 633, 1957; Phys. Rev., 103, 1811, 1956) for the effect of the medium on the bremsstrahlung. A table lists the absorption coefficients of gamma-quanta interacting with the nuclei and electrons of the emulsion. The differential energy spectra of pairs and electrons for energies $E_0 = 10^{11} - 10^{13}$ ev. are listed in another table, whereas the integral spectra of pairs are shown in a figure, from which it is evident that in the soft part of the spectrum the number of pairs computed by the Bethe-Heitler formula is more than double the number obtained by Migdal's formula. As the authors did not possess many statistical data (which are required for a complete solution of the fluctuation problem), they confined themselves to the study of cascades at small depths. Denoting by $Q_\beta(E_0,\mathcal{E},t)$ the actual number of electrons with energies exceeding $\mathcal{E}$ at depth t in an electron cascade with energy E_0, and by $Q(E_0,\mathcal{E},t)$ - the number of pairs with energy $>\mathcal{E}$ formed at a depth $\leq t$, it is

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Computing cascades with ...

possible to formulate the main result as follows: With given E_0, $\mathcal{E}$, t it is always possible to choose the coefficient k in such a way that the cascade distribution with respect to the number $k\frac{Q}{N}$ (or $k\frac{Q}{N_\beta}$) should follow Poisson's distribution with mean value k, whereby N and N_β are the mean values of Q and Q_β respectively. With small t and small $\mathcal{E}$ (1 to 10 Mev), the coefficient k does not depend on E_0 and on the method of calculation (for the energy range under consideration, 10^{10} - 10^{13} ev.). The coefficient k was found to be the same for both electrons and pairs, $k(t_1) = 1.5$ and $k(t_2) = 3$, ($t_1 = 1.0\ t_0$ and $t_2 = 1.5\ t_0$). There are 2 figures, 5 tables and 8 references: 6 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: W. H. Furry, Phys. Rev., 52, 569, 1937; S. K. Srinivasan, J. C. Butcher, B. A. Chartres. H. Messel. Nuovo Cim. Suppl., 9. 77. 1958.

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31541
S/627/60/002/000/024/027
D299/D304

3.2410 (1205, 2705, 2805)

AUTHORS: Varfolomeyev, A. A., Gerasimova, R. I., Gurevich, I.I., ~~Makar'ina, L.A.,~~ Romantseva, A. S., and Chuyeva, S. A.

TITLE: Electron-photon showers with energies of $11^{11} - 10^{13}$ ev. in nuclear emulsions

SOURCE: International Conference on Cosmic Radiation. Moscow, 1959. Trudy. v. 2. Shirokiye atmosfernyye livni i kaskadnyye protsessy, 299-306

TEXT: A detailed investigation was carried out of 15 electron-photon showers with energies $>10^{11}$ ev., at low depths. In contradistinction to other works, the results are compared with those obtained for cascades by the Monte Carlo method. Six emulsion stacks were used, with total volume of about 10 liters. In 5 of the stacks of emulsion Р-НИКФИ (R-NIKFI), the grain density of relativistic electrons was 30 - 35 grains per 100 μ. The energy $E\gamma$ of primary quanta which generate the shower, was determined from the

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Electron-photon showers ...

number of cascade electrons of energy higher than $\mathcal{E}_c$ = 300 Mev, at a depth of 2.5 - 3.0 t_o. A table lists (for comparison) the values of E_f, obtained by the Monte Carlo method and by formula

$$R = \frac{1}{16,1}\left\{45,0 + \ln\left[\left(\frac{2x}{E}\right)^2 (1 + 140\ x)\right]\right\} \qquad (1)$$

where x is the distance from the pair vertex in cm; this formula is semiempirical and represents the ratio of ionization losses of pairs to those of relativistic electrons; the ionization losses are due to mutual shielding of electron and positron fields. In the experiments, particular care was taken to detect the vertices of the electron-positron pairs, formed at depths $\leq 1.5\ t_o$. After determining the lateral shower distribution, the energy of the electrons of the pairs was measured by means of multiple scattering (to an accu-

Card 2/4

Electron-photon showers ...

racy of 20 - 30%) for energies of up to $(5-7)\cdot10^8$ ev. The total number of pairs formed at depths $\leqslant 1.0\ t_0$ and $\leqslant 1.5\ t_0$ with energies higher than (1-2) Mev, is plotted in two figures, from which it is evident that the experimental points fit better the curve which takes into consideration the influence of the medium on the bremsstrahlung (the curve obtained by Migdal's formula); the curve obtained by Bethe-Heitler's formula does not fit the experimental results. The figures also show that not one of the 15 showers under consideration is anomalous. Apparently, the majority of so-called "anomalous" showers, described in literature, can be explained by statistical fluctuations in the cascades or by improper determination of the energy of primary electron-positron pairs. Another figure exhibits the experimental curves of longitudinal shower development; here, too, no appreciable deviations from the corresponding theoretical curves are observed. A table lists data on the number of pairs formed at small distances $r < 0.5\mu$ from the nearest electron track; these data might be useful in analyzing the cross-section for pair formation by high-energy electrons. There are 4

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31541
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D299/D304

Electron-photon showers ...

figures, 3 tables and 21 references: 10 Soviet-bloc and 11 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: K. Pinkau. Nuovo Cim., 3, 1285, 1956; H. Fay. Nuovo Cim., 5, 293, 1957; J. Iwadare. Phil. Mag., 3, 680, 1958; S. K. Srnivasan, J. S. Butcher, B. A. Chartres, H. Messel. Nuovo Cim., 9, 77, 1958.

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21(8) SOV/56-36-3-9/71

AUTHORS: Varfolomeyev, A. A., Gerasimova, R. I., Makar'ina, L. A., Romantseva, A. S., Chuyeva, S. A.

TITLE: Ionization Along the Tracks of Electron-Positron Pairs of High Energy (Ionizatsiya vdol' sledov elektronno-pozitronnykh par vysokoy energii)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 3, pp 707-716 (USSR)

ABSTRACT: In the introduction the authors discuss the problem and the results of several already published works dealing with this subject. Table 1 contains for the 5 investigated showers (E-53, 0-202, D-84, D-44 and I-109) the data of the emulsion piles in which they were recorded (see previous paper by the same authors, reference 7); table 2 contains a list of the E_γ-values according to Janossy (Yanoshi) (Refs 10, 12) and according to Chudakov (Ref 1). (Today it is possible to obtain more exact E_γ-values from curves by the Monte Carlo method by taking the influence exercised by matter on bremsstrahlung into account. The publication of respective results has been announced). A very detailed chapter of this paper deals with gauging of the emulsions (type R-NIKFI). The follow-

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ing experimental data concern the track densities of five high-energy electron-positron pairs in these emulsions. Measurements were carried out on the first pairs of electron-photon showers. Pair energy was determined from the energy spectrum of the cascade electrons at a distance of 2.5 - 3 radiation lengths from the vertex of the first pair. In three cases pair energy was nearly $.10^{12}$ev and in two cases it was approximately 3.10^{11}ev. Track density was determined by two methods: from the grain density in the track and from the gap length distribution coefficient. Compared with a particle for which the specific energy loss is twice as great as the ionization loss of the electron, the track density of the pair near the vertex was found to be smaller. This decrease of the pair track density can be explained by the mutual screening of the electron and positron during ionization. The results obtained are compared with the theoretical ionization curves for pairs calculated by A. Ye. Chudakov (Ref 1). The authors finally thank Professor I. I. Gurevich for his interest and discussions, A. A. Kondrashina for his help in

evaluating measuring results, and D. M. Samoylovich and his group for developing the piles of emulsion plates. There are 8 figures, 2 tables, and 21 references, 3 of which are Soviet.

SUBMITTED: August 18, 1958

24(5),21(7) Varfolomeyev, A. A., Svetlolobov, I. A. SOV/56-36-6-22/66

AUTHORS:

TITLE: Computation of Electromagnetic Cascades by Means of the Monte Carlo Method Taking Account of the Influence of the Medium on Bremsstrahlung (Raschet elektromagnitnykh kaskadov metodom Monte-Karlo s uchetom vliyaniya sredy na tormoznoye izlucheniye)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 6, pp 1771-1781 (USSR)

ABSTRACT: The results of this very detailed paper have partly already been published (Refs 9,10). For the purpose of investigating the high-energy electron-photon showers nuclear emulsion piles are frequently used with good success, which are irradiated in the stratosphere; the emulsions have a radiation unit depth of up to $t_o = 2.9$ cm and are used in piles of up to several liters volume. In such piles it is possible to record single electron-photon showers with primary energies of up to 10^{12} ev and having a length of several radiation units. Such electromagnetic cascades are especially interesting d... pay the initial stages of their development; in the presen...

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the results obtained by cascade computations carried out by the Monte Carlo method are published. The cascades initiated by 10^9, 10^{10}, 10^{11}, 5.10^{11}, 10^{12}, and 3.10^{12} ev primary electrons are computed for depths of up to 2.8 radiation units. Real (non-asymptotic) cross sections for elementary electromagnetic processes in the photographic emulsion are taken into account. Two kinds of computations are carried out: such as are based upon the Bethe-Heitler formulas, and such as take the effect of multiple scattering and polarization of the medium on bremsstrahlung into account. Part 1 of the paper gives a detailed account of the problem and a short survey of several publications dealing with this field. In part 2 the influence exercised by the medium on the bremsstrahlung in the nuclear emulsion (according to Landau and Pomeranchuk (Ref 11), Ter-Mikayelyan (Ref 12), Migdal (Ref 13), and Feynberg et al (Ref 14)) is discussed. Figure 1 compares the energy distribution of electron bremsstrahlung in the emulsion according to Bethe-Heitler and Migdal as well as

Ter-Mikayelyan. In the third part of the paper consideration of the elementary cross sections of the electromagnetic processes is discussed. Experimental data are taken into account for R-NIKFI and Ilford G-5 emulsions. Figure 2 shows the course of the absorption coefficient of γ-quanta computed for formation in pairs, Compton effect, and photoeffect; figure 3 shows the E_0-dependence of the coefficient $\tau = 1/\lambda$ for quantum radiation with an energy $\hbar\omega \geq \varepsilon$ ($\varepsilon = 1.5.10^6$ and 10^8 ev). The following chapter deals with the conditions computing the cascades. Computations are carried out for 4 different depths: $t_1 = 1.0\ t_0$, $t_2 = 1.5\ t_0$, $t_3 = 2.1\ t_0$, and $t_4 = 2.8\ t_0$. The results obtained are shown by numerous diagrams. Thus, six diagrams in figure 4 show the integral energy spectra for various primary energies E_0 of the electron causing the shower and various t_i computed according to Bethe-Heitler, Migdal, Arley, Janossy, and Messel and

Computation of Electromagnetic Cascades by Means of the Monte Carlo Method Taking Account of the Influence of the Medium on Bremsstrahlung

SOV/56-36-6-22/66

Srinivasan et al. Table 1 gives a survey of the differential energy spectra of electrons and pairs in cascade showers for different t_i and different E_0. Further diagrams show energy spectra, the number of electrons in dependence on E_0, and the detection probability for N electrons with $E > 3.10^8$ ev at $E_0 = 10^{12}$. Table 2 finally gives the number of electron-positron pairs with a total energy $\geq 1.5.10^6$ ev for 5 different E_0-values, computed according to Bethe-Heitler and Migdal. In conclusion, the authors thank I. I. Gurevich, A. B. Migdal, and P. E. Nemirovskiy for their interest and consultation, A. A. Dorodnitsin for placing the computer at their disposal, and D. I. Golenko for programing the computation problems. There are 7 figures, 2 tables, and 30 references, 10 of which are Soviet.

SUBMITTED: December 12, 1958

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VARFOLOMEYEV, A.A.; GERASIMOVA, R.I.; GUREVICH, I.I.; MAKAR'INA, L.A.; ROMANTSEVA, A.S.; CHUYEVA, S.A.

Effect of the density of the medium on bremsstrahlung in electron-photon showers involving energies from 10^{11} to 10^{13} ev. Zhur. eksp. i teor. fiz. 38 no.1:33-45 Jan '60. (MIRA 14:9)
(Bremsstrahlung) (Cosmic rays)

S/056/62/042/003/048/049
B108/B102

AUTHORS: Nikol'skiy, B. A., Surkova, L. V., Varfolomeyev, A. A., Sulkovskaya, M. M.

TITLE: Search for the D^+ meson

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 3, 1962, 915-916

TEXT: Owing to its short lifetime (10^{-10} sec) it was hitherto not possible to observe D mesons in K-meson beams. The authors made an attempt to find this strangeness-2 particle near its place of production. An emulsion stack irradiated by 9-Bev protons from the OIYaI synchrotron was investigated for K^+ decays from $D^+ \longrightarrow K^+ + \pi^0$ or similar processes. In such a reaction, a path of the K^+ particle of up to 15 mm would correspond to a mass of the D^+ meson of from M_D = 1230 to 1580 electron masses. 98 events with the K^+ path ≤ 15 mm were detected. It is concluded that the production probability of slow D^+ particles which decay to form a K^+ meson is less than the 500-th part of the production probability for slow K^+ mesons. The authors thank I. I. Gurevich for his

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Search for the D^+ meson

S/056/62/042/003/048/049
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interest as well as A. P. Mishakov, S. A. Yudin, G. V. Pleshivtsev, L. A. Chernyshev, A. M. Alpers, V. M. Kutukov, Z. Galkin, Z. Volobuyev, A. Smelyanskiy, R. I. Cerasimov, L. A. Makar'in, and M. I. Ovsyannikov for assistance. There are 5 references: 2 Soviet and 3 non-Soviet. The three references to English-language publications read as follows: T. Yamanouchi. Phys. Rev., 3, 480, 1959; Y. Eisenberg et al. Phys. Rev., 120, 1021, 1960; V. Cook et al. Phys. Rev., 123, 655, 1961.

SUBMITTED: March 8, 1962

Card 2/2

S/811/62/000/000/003/003

AUTHORS: Varfolomeyev, A.A., Makar'ina, L.A.

TITLE: The density of conglomerates (blobs) in the traces of electron pairs and the geometric effect.

SOURCE: Yadernaya fotografiya; Trudy Tret'yego Mezhdunarodnogo soveshchaniya po yadernoy fotografii. Moskva, iyul' 1960g. K.S. Bogomolov and N.A. Perfilov, eds. Moscow. Izd-vo AN SSSR, 1962, 415-418.

TEXT: The paper presents a report on experimentation and theoretical conclusions relative to the so-called geometric effect which leads to a change in the parameters of the trace of an electron-positron pair under constant ionization losses. Ionization losses on the initial portions of the track of high-energy ($\geq 10^{12}$ ev) electron-positron pairs are attributed to the mutual screening of the electron and positron fields, when their mutual distance r does not exceed an order of $5 \cdot 10^{-3}\mu$. The theoretically predicted effect has been verified experimentally (Varfolomeyev et al., IIme Colloque Internat'l Photogr. Corpusc., Montréal. Presses Univ. Montréal, 1958; ZhETF, v.36, 1959, 707). As the distance r grows up to an beyond the diameter of the sensitized grain, the density of the grains (or conglomerates) of the trace of the pair in a nuclear emulsion attains a value of 2n times the ionization loss; this geometric effect was first pointed out by R. Weill et al. (N.Cimento, v.6, 1957, 413 and 1430). The present study adduces the results of measurements of the density

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The density of conglomerates (blobs) in the traces... S/811/62/000/000/003/003

of the conglomerates and the density of the gaps along the traces of 18 e_-/e_+ pairs. The finding that the changes in probability of a flare-spot formation on AgBr grains are attributable to the geometric effect are very small contradicts Weill's conclusions. The traces of the 18 pairs had energies of $8.5 \cdot 10^{10}$ to $2.2 \cdot 10^{13}$ ev; they were registered in six emulsion pilas with a total volume of 10 liters which were irradiated in the stratosphere. The energy of a pair was determined by the electron-cascade energy-spectrum method expounded in Varfolomeyev et al., ZhETF, v. 38, 1960, 33. The density of the traces was established from a visual determination of the density of conglomerates or blobs and from a measurement of the density of the gaps along the trace of a pair. An appreciable geometric effect is noted on the magnitude of the density of the conglomerates, but not on that of the gaps. This is attributed to growing flarespots between grains, until the distance has attained a value comparable to the diameter of a sensitized grain, a=0.6μ; there is no comparable growth in the size of the gaps. Weill's inconsistent results are attributed to a possible misunderstanding of Della Corte's data (cf. N. Cim., v. 10, 1953, 958) relative to the effect of pair recombination on the probability of the flaring of AgBr grains. There are 1 figure and 6 references (3 Soviet and 3 English-language).

ASSOCIATION: Institut atomnoy energii im. I. V. Kurchatova (Institute of Atomic Energy imeni I. V. Kurchatov). Academy of Sciences, [illegible] USSR.

Card 2/2

ACC NR: AP6014043 SOURCE CODE: UR/0056/66/050/004/1024/1035

AUTHOR: Varfolomeyev, A. A.

ORG: none

TITLE: Stimulated scattering of light by light

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v.50, no.4, 1966, 1024-1035

TOPIC TAGS: laser, light scattering, quantum yield, laser beam

ABSTRACT: Since theoretically calculated photon-photon scattering cross sections are exceedingly small, the authors suggest that a third beam of photons at a frequency corresponding to the two colliding beams be used in order to observe the scattering of light by light. It is shown that under such conditions the fourth-order photon interaction can become observable with probability sufficient for its registration when in addition to the two oppositely directed beams focused in one point in space a third beam is focused on the same spot in a direction perpendicular to the first two. It is shown that in this case the probability of scattering of the photons of the first two beams increases in proportion to the photon density in the third beam.

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ACC NR: AP6014043

The scattered photons are emitted in a direction opposite to that of the third beam. The theory of the process is described, and a numerical estimate shows that laser beams with energy of 10 kJ can yield a scattered-quantum yield of 0.02 photon per steradian per discharge, so that 50,000 discharges can provide an intensity that can be measured with presently available devices. The many practical difficulties that still stand in the way of the realization of such an experiment (proper focusing, elimination of background, adequate cooling between discharges, feasibility of lasers of small volume and large radiation intensity, etc.) are briefly discussed. The author thanks R. A. Vanetsian for interesting discussions that initiated this research; A. I. Baz', V. M. Galitskiy, D. T. Grechukhin, and I. I. Gurevich for a discussion of the results and remarks; and L. B. Drabkin for help with numerical calculations. Orig. art. has: 3 figures, 22 formulas, and 2 tables.

SUB CODE: 20/ SUBM DATE: 01Nov65/ ORIG REF: 002/ OTH REF: 004

Card 2/2

VARFOLOMEYEV, A.M. (Novokuznetsk, Kemerovskoy oblasti, prospekt Stroiteley, d.3)

Calculation of loads in treating closed fractures of the diaphysis of the femur by skeletal traction. Ortop., travm. i protez. 25 no.11:38-43 N '64. (MIRA 18:11)

1. Iz kafedry travmatologii i ortopedii (zav. - prof. L.G. Shkol'nikov) Novokuznetskogo instituta usovershenstvovaniya vrachey (rektor - dotsent G.L. Starkov). Submitted March 18, 1964.

21(7) SOV/56-35-2-49/60

AUTHOR: Varfolomeyev, A. T.

TITLE: On the Absorption of Slow Negative Pions by Nuclei
(O pogloshchenii medlennykh π^--mezonov yadrami)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 2(8), pp 540-541 (USSR)

ABSTRACT: The hypothesis of the primary distribution of the rest energy of a meson in a group of 2 - 4 nucleons cannot be considered as experimentally proved. This paper endeavors to explain the possible influence exercised by the collective interactions between the nucleons within the nucleus on this process. For this purpose, the author investigated the nuclear disintegrations caused by the absorption of slow negative pions by the light nuclei of the photoemulsion. The results of these experiments are investigated and will be discussed in a later paper. The present paper deals only with one specific example of such a disintegration where the collective interactions occur with particular distinctness, i.e. with a reaction of the type $A + \pi^- \rightarrow B + n$. The final products of this reaction are a fast neutron and

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a residual nucleus B in the ground state. However, a reaction of the type $A + \pi^- \rightarrow B^* + n$ in which the momentum of one fast (~80 - 100 MeV) neutron is compensated by the excitation of the residual nucleus which decays with emission of some secondary particles is frequently found. The reaction $A + \pi^- \rightarrow B + n$ has to be considered as a special case of a more general type of disintegration which corresponds to the reaction $A + \pi^- \rightarrow B^* + n$. In photonuclear emulsions НИ КФИ (type Я and type K) which had been filled up with BeF_2 and were irradiated with slow negative pions in a meson beam of the synchrocyclotron of the Ob"yedinennyy institute yadernykh issledovaniy (United Institute of Nuclear Research) 12 disintegrations were found; they correspond to the reaction

$$Be^9 + \pi^- \rightarrow Li^8 + n_0^1, \quad Be^{8*} \xrightarrow{\beta^-} 2\alpha.$$

A typical example of such disintegrations is represented by a figure. All the fragments of Li^8 had ranges of 34 μ with a straggling of ± 1 μ. The value 140,6 MeV is obtained for the total energy yield of this reaction. The fragments of Li^8 are therefore generated either in the ground state or in an excited state with not more than ~2 MeV. The character

of the observed disintegrations does not correspond to the hypothesis of the primary distribution of the rest energy of the negative pion among a group of a few nucleons. The disintegrations discussed in this paper demonstrate that the collective interactions of the nucleons within a nucleus may play an important rôle in the absorption of slow negative pions. An investigation of a more extensive class of "stars" will confirm this conclusion. The author thanks Professor V. I. Veksler, who supervised work, for his constant interest and for his useful discussions, and also V. G. Larionova for her help in carrying out the experiments. The author also thanks S. M. Korenchenko and V. G. Zinov for their help in working with the meson beam. There are 1 figure and 7 references, 0 of which is Soviet.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute im. P. N. Lebedev, AS USSR)

SUBMITTED: May 21, 1958

S/056/62/042/003/010/049
B117/B112

AUTHOR: Varfolomeyev, A. T.

TITLE: Comparison of the excitation energies of B^{11} produced in the reactions $C^{12}(\pi^-, n)B^{11}$ and $C^{12}(p, 2p)B^{11}$

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 3, 1962, 713 - 714

TEXT: The excitation energies of B^{11} from the reactions

$$C^{12} + \pi^- \longrightarrow 2He^4 + H^3 + n \qquad (1) \text{ and}$$

$$C^{12} + \pi^- \longrightarrow Li^8 + He^3 + n \qquad (2)$$

were measured with the nuclear emulsions Ilford C-2 and НИКФИ Я-2 (NIKFI Ya-2) bombarded with slow π^- mesons. The measurements were made for two cases of B^{11} decay: in one case, B^{11} decayed into two alphas and a triton, and in the second case, it decayed into Li^8 and He^3. Although the decay thresholds differed considerably, the energy distributions in the range of

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high excitation energies were the same in both cases. The good agreement between these results and the data obtained in Ref. 1 (see below) for the B^{11} excitation energy distribution in the reaction $C^{12}(p, 2p)B^{11}$ suggested an excitation mechanism of residual nuclei, which manifests itself in the range of high energies, and is possibly a transition of pairs of nucleons from a shell of lower energy to one of higher energy. This is most probably a transition from the p-shell to the 2s-shell. Such transitions are permissible with any state of other nucleons involved in the reaction. If this assumption is correct, B^{11} probably decays via Li^7 in the reactions in question, and the energy of alphas emitted during the decay of B^{11} is probably higher than in the case of Li^7 decay since the alpha momentum in the first case is compensated by the Li^7 nucleus, and in the second case by the triton. In addition, a greater amount of energy can be imparted to the decay products of B^{11}. A spectrum analysis of alphas produced in reaction (1) at excitation energies above 25 Mev showed agreement with the reaction mechanism proposed here for two energy ranges of these particles.

Comparison of the excitation...

There are 2 figures and 1 non-Soviet reference. The reference to the English-language publication reads as follows: H. Tyren, P. Hillman, Th. A. J. Maris, Nucl. Phys., 7, 10, 1958.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev of the Academy of Sciences USSR)

SUBMITTED: October 10, 1961

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35560

S/056/62/042/003/013/049
B152/B102

24,6700

AUTHOR: Varfolomeyev, A. T.

TITLE: High-energy fragments emitted during the absorption of a slow π^--meson by an O^{16} nucleus

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 3, 1962, 725-726

TEXT: On exposing nuclear plates of the type НИКФИ Я-2 (NIKFI Ya-2) to a beam of slow π^--mesons generated by the synchrocyclotron of the Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research) the author found that a O^{16} nucleus is disintegrated into Li^8, Be^7 and n^1. These fragments can only be produced as a result of direct interaction between the π^--meson and two nucleon groups. From a microphotograph it can be seen that this disintegration is followed by the formation of two charged particles. One of these is Li^8 which at the end of its path splits into two α-particles. The width of the path of

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High-energy fragments emitted during...

the second fragment indicates that its charge is ≥ 2. The length of the tracks is 154 and 110μ and the angle between them 170°. In order to find out which of the light emulsion nuclei (C^{12}, N^{14}, O^{16}) disintegrated the laws of energy and momentum conservation were applied. From this calculation the conclusion $O^{16} + \pi^- \rightarrow Li^8 + Be^7 + n$ was possible. The fragment energies are: E_{Li} = 38.4 Mev, E_{Be} = 41.6 Mev, E_n = 9.3 Mev. The pion rest energy yields the total reaction energy 139.6 Mev; almost the whole energy remaining after subtracting the binding energy (50 Mev) is transferred to Li^8 and Be^7. The fragment momenta are nearly equal (756 and 736 Mev/c) and almost in opposite direction to each other. These kinematic characteristics lead to the assumption that the greatest part of the meson energy is immediately absorbed by two nucleon groups the masses of which are approximately equal to the masses of the observed fragments. A lot of the fragments observed during the disintegration of nuclei by high energy particles is possibly caused by the formation and absorption of mesons during the development of a cascade inside the nucleus. There are 1 figure and 2 references: 1 Soviet and 1 non-Soviet.

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S/056/62/042/003/013/049
B152/B102

High-energy fragments emitted during ...

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute imeni P. N. Lebedev of the Academy of Sciences USSR)

SUBMITTED: October 19, 1961

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ACCESSION NR: AP4042365 S/0056/64/047/001/0030/0039

AUTHOR: Varfolomeyev, A. T.

TITLE: Investigation of photodisintegration of He^3

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 1, 1964, 30-39

TOPIC TAGS: He^3 photodisintegration, two particle He^3 photodisintegration, three particle He^3 photodisintegration, He^3 photodisintegration cross section

ABSTRACT: Photodisintegration of He^3 has been investigated by means of a cloud chamber in a magnetic field at a maximum gamma-bremsstrahlung energy E_{max} = 170 Mev. In contrast to the theory in which the interaction of particles in the final state is not taken into account, it was found that the ratio of two-particle disintegration yield to three-particle disintegration yield for He^3 is equal to unity. The measurement of the effective cross section of two-particle photodisintegration shows a broad maximum at 12—13 Mev. The magnitude of the cross section at the maximum is ~1 mbarn. The integral cross section is 26.5 ±1.3 Mev·mbarn. The integral cross section for pnoton

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VARFOLOMEYEV, A.T.

Fission of light nuclei by slow π^--mesons. Trudy Fiz. inst. 22:101-128 '64. (MIRA 17:9)

VARFOMOLEYEV, A.V.

GROSS, Ye.F.; ZHILICH, A.G.; ZAKHARCHENYA, B.P.; VARFOLOMEYEV, A.V.

Magneto-optical studies of quadrupole exciton transitions in Cu_2O crystals. Fiz.tver.tela 3 no.5:1445-1452 My '61. (MIRA 14:6)

1. Fiziko-tekhnicheskiy institut imeni A.F.Ioffe AN SSSR, Leningrad. (Excitons) (Cuprous oxide--Magnetic properties) (Crystal lattices)

S/0051/64/016/003/0455/0460

ACCESSION NR: AP4020956

AUTHOR: Zakharchenya,B.P.; Makarov,V.P.; Varfolomeyev,A.V.; Ryaskin,A.Ya.

TITLE: Zeeman splitting of the principal emission line in $CaF_2:Tm^{2+}$ crystals

SOURCE: Optika i spektroskopiya, v.16, no.3, 1964, 455-460

TOPIC TAGS: Zeeman effect, Zeeman splitting, thulium doped calcium fluoride, thulium activated calcium fluoride, calcium fluoride, thulium 2+, thulium ion, crystal structure, transition probability

ABSTRACT: Observation of the Zeeman effect in the spectra of crystals doped with transition-group ions can yield information on the symmetry of the states involved in the detected transitions, the multipole order of the transitions, and on the crystal structure and field. Zeeman splitting in the optical spectra of $CaF_2:RE^3$ (RE = rare earth) crystals was first observed and investigated by V.A.Arkhangel'skaya and P.P.Feofilov (Opt©.i spetn,4,602,1958) and has subsequently been studied by other authors. The present work is devoted to investigation - experimental and theoretical - of Zeeman splitting of the intense 1.116-μ line of the divalent thulium ion in CaF_2. The associated transition is identified. The infrared

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spectra were observed by means of a DFS-12 double monochromator in which the standard diffraction grating was replaced by a special grating with 600 lines/mm and which concentrated 76% of the light in the 0.8 to 2.5-μ region. The linear dispersion was 10 Å/mm. The radiation detector was a liquid-nitrogen-cooled FEU-22 photomultiplier. The field was produced by a magnet with 30-mm-diameter Permendur pole pieces and a gap of 20 mm; the highest field strength was 40-kOe. The $CaF_2:Tm^{2+}$ single crystals were prepared by gamma-irradiation of $CaF_2:Tm^{3+}$ crystals. The specimens were cooled to 77 and 4.2°K. The splitting in the 40 kOe field varies in the range from under 3 to over 9 cm^{-1}, depending on the orientation of the magnetic field, the direction of observation, and the orientation of the electric vector of the light. The components of the doublet are not always equal. The results are analyzed from the theoretical standpoint. An attempt made to observe the splitting of the second intense line at 1.189 μ proved vain for reasons that are still obscure. "The authors acknowledge their gratitude to Ye.F.Gross for his interest in the work and to P.P.Feofilov for useful suggestions." Orig.art.has: 25 formulas and 3 figures.

EWT(m)/EEC(t)-2/EPR/EEC(t)/T/

the spectrum ...

SOURCE: Fizika tverdogo tela, v. 7, no. 5, 1965, 1428-1435

TOPIC TAGS: laser, fluorite laser, Zeeman effect, fluorite dysprosium laser, cw laser

ABSTRACT: The Zeeman splitting of the emission line at λ = 2.36 μ in the spectrum of the CaF_2:Dy^{2+} system was experimentally investigated. It is noted that ... Zeeman splitting was ob- ... magnetic field ...

... assumption that ... Zeeman ... equal or almost equal components ...

Card 1/2

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R001858610015-6"

VARFOLOMEYEV, D.F.; BUGAY, Ye.A.; DUDIN, V.N.; ZAGRYATSKAYA, L.M.; ANTIPIN, M.K.; MARKINA, A.I.; POLINSKAYA, M.R.;

Recovering spent caustic using flue gases. Trudy Bash NIINP no.5: 319-322 '62. (MIRA 17:10)

1. Ordena Lenina Ufimskiy neftepererabatyvayushchiy zavod.

ACCESSION NR: AR3000552 S/0081/63/000/007/0516/0516

SOURCE: RZh. Khimiya, Abs. 7P146

AUTHOR: Masagutov, R. M.; Sultanov, A. S.; Varfolomeyev, D. F.; Berg, G. A.; Kulinich, G. M.; Safayev, A. S.

TITLE: Activity of Al-Co-Mo and Al-Ni-Mo catalysts in hydro-refining of diesel fuels

CITED SOURCE: Dokl. AN UzSSR, no. 10, 1962, 21-24

TOPIC TAGS: diesel fuels; hydro-refining; Al-Co-Mo and Al-Ni-Mo catalysts

TRANSLATION: Data are presented on hydro-refining of diesel fuel from a mixture of Tuymazinskaya and Romashkinskaya petroleum, over industrial Al-Co-Mo I and Al-Ni-Mo II catalysts. The experiments were conducted at total pressure of 50 at and circulation of hydrogen-contain-

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ACCESSION NR: AR3000552

.ing gas of 500 rated liters/liter raw material. In the first series of experiments, with a space velocity of raw material feed of 2.0 hour sup -1, average temperature in the reactor varied from 250 to 410°; in the 2nd series the temperature was maintained at 380° and space velocity of raw material feed was 1.0-5.0 hour sup -1. At hydro-refining temperatures up to 320° the extent of desulfurization over II increases, and in the temperature range above 350° it becomes 10% higher than the extent of desulfurization over I. Under the conditions of a hydro-refining at a temperature above 400° a decomposition of the raw material is observed. At the same time the extent of desulfurization over II, at all the investigated space velocities of raw material feed, is approximately 10% higher than over I. The data obtained show that II is more active in hydro-refining of diesel fuel to remove the S-compounds; its use makes it possible to increase space velocity of raw material feed by more than 2 times, in comparison with the results obtained over I. At the same time the product is purified from S- compounds to the extent of 85%. A. Nagatkina

DATE ACQ: 21May63 ENCL: 00 SUB CODE: 00

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L 16830-63 EPF(c)/BDS AFFTC/ASD S/0286/63/000/003/0036/0036 61

ACCESSION NR: AP3003265

AUTHOR: Bugay, Ye. A.; Varfolomeyev, D. F.; Zagryatskaya, L. M.; Prokof'yeva, Ye. M.

TITLE: Method of increasing stability of gasoline. Class C 10g; 23b, 1 sub 04. No. 152924

SOURCE: Byul. izobreteniy i tovarnykh znakov, no. 3, 1963, 36

TOPIC TAGS: gasoline, inhibitor, phenolic oil, oxidation, oxidation inhibitor

ABSTRACT: Method of increasing the stability of gasolines by adding oxidation inhibitors; its distinguishing feature is that the oxidation inhibitor used is acid phenolic oil. /Abstracter's note: complete translation./ Orig. art. has no figures, tables, or formulas.

ASSOCIATION: none

SUBMITTED: 09Apr62 DATE ACQ: 23Jul63 ENCL: 00

SUB CODE: FL NO REF SOV: 000 OTHER: 000

Card 1/1

VARFOLOMEYEV, D.F.

Order of Lenin Ufa Petroleum Refinery is twenty-five years old. Khim. i tekh. topl. i masel 8 no.12:1-4 D '63. (MIRA 17:1)

MASAGUTOV, R.M.; BERG, G.A.; KIRILLOV, T.S.; VARFOLOMEYEV, D.F.; KULINICH, G.M.; SKUNDINA, L.Ya.

Hydrofining of diesel fuel from high sulfur-bearing crude with a decreased consumption of hydrogen. Khim. i tekh. topl. i masel 8 no.12:7-12 D '63. (MIRA 17:1)

1. Bashkirskiy nauchno-issledovatel'skiy institut po pererabotke nefti i Ufimskiy neftepererabatyvayushchiy zavod.

ACCESSION NR: AP4009781 S/0065/64/000/001/0017/0023

AUTHOR: Varfolomeyev, D. F.

TITLE: Experimental and perspective reprocessing of high-sulfur petroleums at UNPZ

SOURCE: Khimiya i tekhnologiya topliv i masel, no. 1, 1964, 17-23

TOPIC TAGS: high-sulfur petroleum, UNPZ, Ufimsk petroleum reprocessing plant, thermal cracking, Arlansk crude

ABSTRACT: As a result of introducing a series of technological improvement, the Ufimsk petroleum reprocessing plant is now ready to reprocess high-sulfur petroleums of the Arlansk type. Fig. 1 shows the thermal cracking unit. It is pointed out that in order to thoroughly improve the technoloyy of reprocessing these petroleums it is necessary to complete reconstruction of the processing units in the plant and introduce new more effective processing units (this, in accordance with plans for converting the entire plant to reprocessing high-sulfur petroleums). Orig. art. has: 7 Tables and 2 Figures.

Card 1/1

KULAKOV, V.N.; VARFOLOMEYEV, D.F.; BONDARENKO, M.F.; KOTOVA, V.N.; AKHMETOV, I.G.; KOLYCHEV, V.M.; NOSAL', G.I.; KIVA, V.N.; PANKRATOVA, M.F.; KRUGLOV, E.A.; SHMELEV, A.S.; SHABALIN, I.I.; SHIRMUKHAMETOV, O.A.; ISYANOV, I.Ya.; RATOVSKAYA, A.A.; VAYSBERG, K.M.

Technology of the production of naphthalene from the refining products of eastern oils. Nefteper. i neftekhim. no. 4:30-33 '64. (MIRA 17:5)

1. Nauchno-issledovatel'skiy institut neftekhimicheskikh proizvodstv i ordena Lenina Ufimskiy neftepererabatyvayushchiy zavod.

ACCESSION NR: AP4036978 S/0065/64/000/005/0017/0022

AUTHOR: Masagutov, R. M.; Berg, G. A.; Varfolomeyev, D. F.; Selivanov T. I.; Bugay, Ye. A.; Mukhametov, M. N.; Kulinich, G. M.; Sokolova, V. I.

TITLE: Development of a process for high-purity cyclohexane

SOURCE: Khimiya i tekhnologiya topliv i masel, no. 5, 1964, 17-22

TOPIC TAGS: cyclohexane, benzene, benzene hydrogenation, catalyst, nickel on kieselguhr, benzene purification, thiophene, sulfur compound, cyclohexane production

ABSTRACT: An industrial process for cyclohexane has been developed on the basis of preliminary pilot tests. Cyclohexane of adequate purity was produced by the one-step hydrogenation of benzene (cyclohexane content, < 0.4%; thiophene content, < 0.00001%) on technical-grade nickel on kieselguhr catalyst under the following conditions: pressure 10 kg/cm^2 gage; space velocity of benzene feed, 0.5—0.6 hr^{-1}; maximum reactor temperature, 120—150C; hydrogen/benzene ratio, 3000

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ACCESSION NR: AP4036978

m^3/m^3. Catalyst activity did not drop after 15 days of continuous service. However, the degree of conversion of benzene containing 0.08% thiophene and 0.010% carbon disulfide dropped rapidly from 100 to 60%. Thus, a study was made of the possibilities for the preliminary purification of benzene to remove sulfur compounds. The study took into account data from the literature which indicate that thiophene in contact with the catalyst surface simultaneously blocks five active nickel atoms. In hydrogen the adsorbed thiophene molecule can decompose with the formation of a hydrocarbon molecule and of an S atom. The S atom combines with a nickel atom, but the hydrocarbon molecule desorbs from the catalyst surface, liberates four previously bound Ni atoms, and increases the S adsorption capacity of the catalyst. The results of the study and laboratory experiments have made it possible to develop a large-scale unit for the production of cyclohexane from benzene (containing 0.1—0.8% cyclohexene, up to 0.03% hexane, 0.02% other hydrocarbons, and 0.01—0.04% total sulfur) under the following [approximative] conditions: pressure, normal; temperature, 110 to 150C; space velocity of benzene feed, 0.2—0.85hr^{-1}; hydrogen/benzene molar ratio, 9.5—20. The process is conducted in

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ACCESSION NR: AP4036978

two steps: purification of benzene from S compounds and hydrogenation on two reactors connected in series. The unit has been in operation for two years. The cyclohexane is being used for making polyethylene. Orig. art. has: 3 figures and 2 tables.

ASSOCIATION: BashNIINP; OLUNPZ

SUBMITTED: 00	DATE ACQ: 05Jun64	ENCL: 00
SUB CODE: GC	NO REF SOV: 014	OTHER: 006

3/3
Card

ACCESSION NR: AT4043273 S/2744/64/000/007/0036/0046

AUTHOR: Masagutov, R. M., Berg, G. A., Kirillov, T. A., Varfolomeyev, D. F., Kulinich, G. M., Skundina, L. Ya.

TITLE: Methods for decreasing the hydrogen consumption during hydrofining of Diesel fuel from high-sulfur petroleum

SOURCE: Ufa. Bashkirskiy nauchno-issledovatel'skiy institut po pererabotke nefti, Trudy*, no. 7, 1964. Sernisty*ye nefti i produkty* ikh pererabotki (Sour crude oil and products of refining), 36-46

TOPIC TAGS: petroleum, Diesel fuel, desulfurization, hydrogen consumption, hydrocarbon, naphthenic hydrocarbon, dehydrogenation, petroleum refining, hydrofining, high sulfur petroleum, Arlan petroleum

ABSTRACT: Since the main difficulty in the hydrofining of petroleum is supplying the refinery with hydrogen, the authors attempted to utilize the hydrogen liberated during the process itself as a result of dehydrogenation of the naphthenic hydrocarbons in the raw material. An Arlan petroleum fraction (density 0.863, sulfur content 2.58%, iodine

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ACCESSION NR: AT4043273

number 9.4%, sulfurization 34.7%) was used as a test sample in a closed system in which a gas containing 90% hydrogen circulated over a technical aluminum-cobalt-molybdenum catalyst. The effect of different factors, such as temperature, pressure and feed rate, on the degree of desulfurization, iodine number, hydrogen consumption and the duration of action of the catalyst was investigated. The hydrogen consumption was determined both by the variation in the composition of raw material and desulfurized product and by direct measurement. It was found that decreasing the pressure from 50 to 30 atm. and increasing the temperature from 380 to 410C during refining decreases the hydrogen consumption by 27%. Under these conditions, the technical aluminum-cobalt-molybdenum catalyst has a long life and ensures a product of good quality. Hydrofining at a pressure of 20 atm. and temperature of 410C cannot be recommended, even though this reduces the hydrogen consumption by an additional 21%, because the lifetime of the catalyst between regenerations is insufficient. A prolonged catalytic action is made possible by lowering the temperature to 350C. At this temperature, the hydrogen consumption can be decreased by 35-50% while maintaining the extent of desulfurization at 70-80%. Orig. art. has: 12 figures and 6 tables.

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ACCESSION NR: AT4043273

ASSOCIATION: Bashkirskiy nauchno-issledovatel'skiy institut po pererabotke nefti, Ufa (Bashkir Scientific Research Institute for Petroleum Refining)

SUBMITTED: 00

ENCL: 00

SUB CODE: FP

NO REF SOV: 005

OTHER: 000

Card 3/3

ACCESSION NR: AT4043277 S/2744/64/000/007/0121/0127

AUTHOR: Masagutov, R. M., Berg, G. A., Varfolomeyev, D. F., Selivanov, T. I., Bugay, Ye. A., Kulinich, G. M., Sokolova, V. I., Mukhametov, M. N.

TITLE: Purification of benzene by chemisorption

SOURCE: Ufa. Bashkirskiy nauchno-issledovatel'skiy institut po pererabotke nefti. Trudy*, no. 7, 1964. Sernisty*ye nefti i produkty* ikh pererabotki (Sour crude oil and products of refining), 121-127

TOPIC TAGS: benzene, desulfurization, chemisorption, nickel kieselguhr catalyst, thiophene, carbon disulfide, cyclohexane, purification

ABSTRACT: Since neither sulfuric acid treatment nor hydrofining guarantee complete removal of sulfur from benzene, the authors investigated the chemical desulfurization of a benzene sample containing 0.08% (by weight) thiophene, 0.0102% carbon disulfide and 0.3% cyclohexane, using a commercial nickel catalyst on kieselguhr (0.93 g/cc bulk density) with 60% nickel. Desulfurization was more effective at higher temperatures than at room temperature. The high degree of purification obtained at 170-180C may be due both to a better contact between the benzene and the catalyst and a higher diffusion rate. When benzene samples were purified at 170-180C with the addition of hydrogen, the adsorptivity of the catalyst was increased 4.4 times as compared to the usual adsorption conditions. This

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ACCESSION NR: AT4043277

important finding verified the mechanism of chemisorption and showed that the sulfur-adsorbing capacity and selectivity of the catalyst are important factors. The working "sulfur-capacity" of nickel over kieselguhr is 1.33% for thiophenic sulfur under the following recommended experimental conditions: atm. pressure, 150-180C, feed rate of raw material 1.0 hr^{-1}, hydrogen 10-30 vol. per vol. of benzene. The duration of action of a catalyst depends especially on its sulfur-adsorbing capacity; therefore, the purified benzene was investigated for sulfur content plotted against the time of catalysis. Sixty liters of benzene purified with 1 liter of catalyst showed no sulfur in the sample, but on further use of this same catalyst, sulfur appeared in gradually increasing amounts. It was found that 60-70 liters of benzene containing 0.03% sulfur could be purified with 1 liter of catalyst. The sulfur distribution in the catalyst with height of the layer in the reactor is also shown. On the basis of the experimental data, nickel on kieselguhr is recommended as a catalyst for the desulfurization of benzene. Orig. art. has: 4 figures.

ASSOCIATION: Bashkirskiy nauchno-issledovatel'skiy institut po pererabotke nefti, Ufa (Bashkir Scientific Research Institute for Petroleum Refining)

SUBMITTED: 00 ENCL: 00

Card 2/2 SUB CODE: OC, FP NO REF SOV: 009 OTHER: 006

MASAGUTOV, R.M.; BERG, G.A.; VARFOLOMEYEV, D.F.; SELIVANOV, T.I.; RUGAY, Ye.A.; MUKHAMETOV, M.N.; KULINICH, G.M.; SOKOLOVA, V.I.; KIRILLOV, T.S.

Hydrogenation of benzene on a nickel catalyst on kieselguhr. Trudy BashNII NP no.7:127-133 '64. (MIRA 17:9)

VARFOLOMEYEV, D.F.

Experience in and prospects of the processing of oils with high sulfur content at the Ufa Petroleum Refinery. Khim. i tekh. topl. i masel 9 no.1:17-23 Ja '64. (MIRA 17:3)

1. Ufimskiy ordena Lenina neftepererabatyvayushchiy zavod.

MASAGUTOV, R.M.; BERG, G.A.; VARFOLOMEYEV, D.F.; SELIVANOV, T.I.; BUGAY, Ye.A.; MUKHAMETOV, M.N.; KULIKICH, G.M.; SOKOLOVA, V.I.

Developing a process for obtaining cyclohexane of high purity. Khim. i tekh. topl. i masel 9 no.5:17-22 5 My'64 (MIRA 17:7)

1. Bashkirskiy nauchno-issledovatel'skiy institut po pererabotke nefti i Ufimskiy neftepererabatyvayushchiy zavod.

SOURCE: Neftepererabotka i neftekhimiya, no. 7, 1964, 3-4

TOPIC TAGS: petroleum refining, [illegible], diesel fuel, catalytic cracking, sulfur content

ACCESSION NR: AP5001627

[illegible]

ASSOCIATION: Ufimskiy ordena Lenina neftepererabatyvayushchiy zavod (Ufa petroleum refinery); BashNIINP

SUBMITTED: [illegible]

SOURCE:

TOPIC TAGS: water purification, diesel fuel, hydrogen

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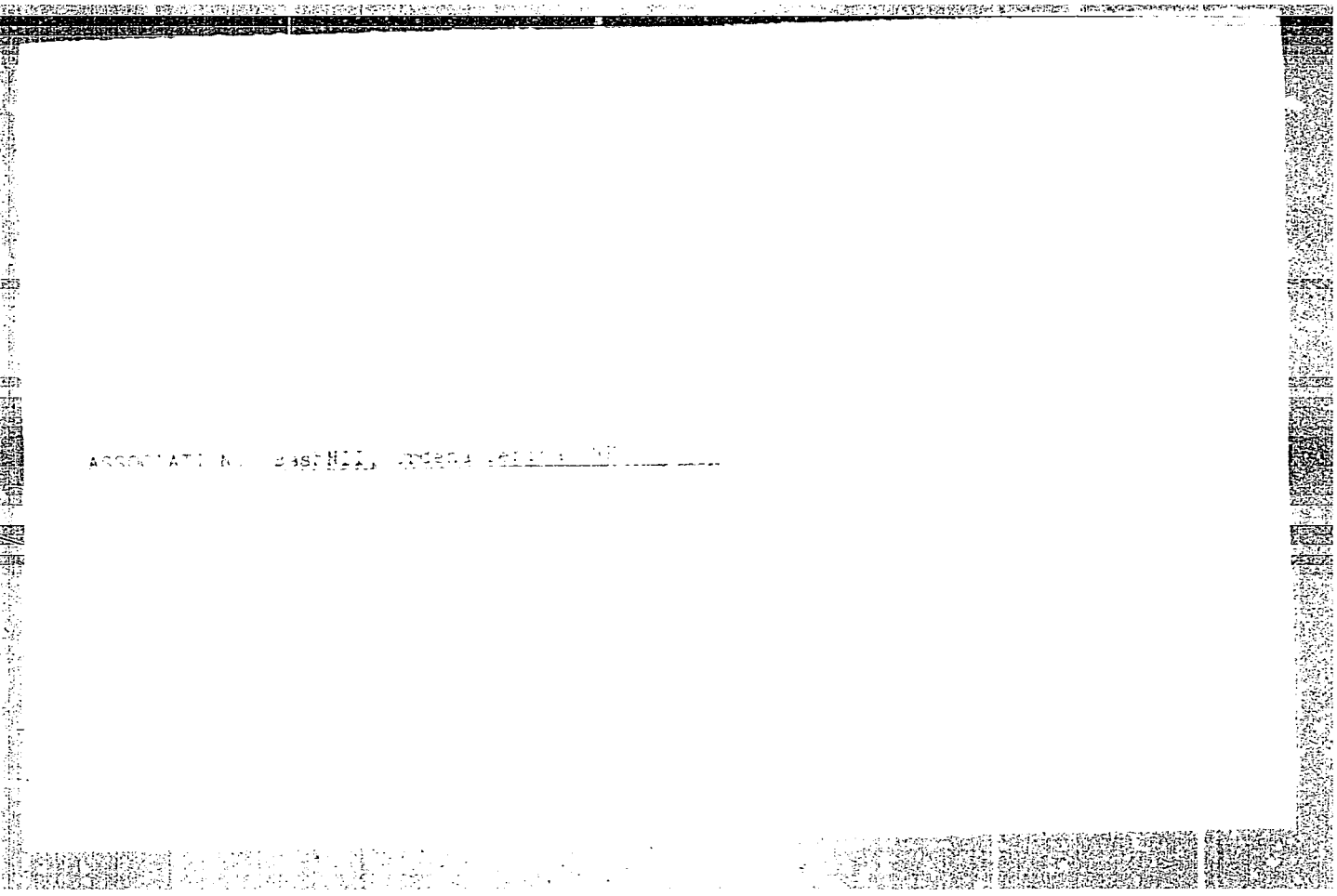

VARFOLOMEYEV, D.I.

Drilling deep holes with precise center-to-center distances.
Priborostroenie no.4:24-25 Ap '63. (MIRA 16:4)
(Drilling and boring)

VARFOLOMEYEV, D.I.

Using permanent magnets for fastening measuring instruments and devices. Priborostroenie no.12:27-28 D'63. (MIRA 17:5)

BIBIN, Leonid Pavlovich; VARFOLOMEYEV, F.G.; KALGANOV, D.I.; OSTANOVSKIY, T.S.; PUSHKIN, V.S.; TRAKHTENBERG, G.L.; MAKSIMOVICH, A.G., red.; SUDAK, D.M., tekhn.red.

[School and office supplies, musical instruments, photographic supplies, radio equipment, athletic goods, hunting and fishing equipment, toys] Tovary shkol'no-pis'mennye, kantseliarskie, muzykal'nye, foto, radio, sportivnye, okhotnich'i, rybolovnye, igrushki. Moskva, Gos. izd-vo torg. lit-ry, 1958. 328 p. (MIRA 11:4)
(Manufactures)

GLOBUS, L.M.; ZALESSKIY, V.A.; ISAYEV, K.N.; KOLGANOV, D.I.; VARFOLOMEYEV, F.G., spetsial'nyy red.; BEL'KOVICH, A.V., red.; BRODSKIY, M.P., tekhn. red.

[Hunting and fishing appliances; a handbook] Okhotnich'i i rybolovnye tovary; spravochnik. [By] L.M. Globus i dr. Moskva, Gostorgizdat, 1963. 135 p. (MIRA 16:6)
(Fishing--Equipment and supplies)
(Hunting--Equipment and supplied)

VARFOLOMEYEV, F.G.; GEL'FENBOYM, M.Sh.; KOTOVICH, Yu.V.; OSTANOVSKIY, T.S.; SEMENETS, V.M.; SHIROKOVA, Ye.A.; EYGINSON, Ye.N.; VVEDENSKIY, S.F., red.; SIMEL'NIKOVA, TS.B., red.; TSESARKIN, L.D., red.

[Study of goods serving cultural needs] Tovarovedenie kul'ttovarov. [By] F.G.Varfolomeev i dr. Moskva, Izd-vo Ekonomika, 1964. 471 p. (MIRA 17:5)

ANDON'YEV, S.M.; GLAZKOV, P.G. [deceased]; KUCHIN, V.A. KONDRAT'YEV, Ye.M.; LEVITASOV, Ye.M.; MAKAROV, K.I.; PANKRATOV, F.V.; PEVNYY, N.I.; POKRAS, L.M.; POCHTMAN, A.M.; TESNER, P.A.; SHEYNFAYN, F.I.; SHKLYAR, T.I.; Prinimali uchastiye: BERMAN, M.N.; VARFALOMEYEV, F.L.; ROBIN, M.A.; MOYSIYEVICH, G.I.; SAPIRO, V.S.; ALEKSEYEV, L.M.; POPOVA, R.S.

Heating Martin furnaces with natural gas using reformers. (MIRA 17:12)
Gaz. prom. 9 no.11:14-17 '64.

VORONOV, R.A., doktor tekhn.nauk; VARFOLOMEYEV, G.N., inzh.

Derivation of a principal magnetization curve using an electronic oscillograph. Trudy OMIIT 42:101-106 '63. (MIRA 18:10)

VARFOLOMEYEV, G.N., inzh.

Analysis of the operation of the master oscillator of a static frequency converter. Trudy OMIIT 42:117-126 '63.

Static d.c. to single-phase a.c. converter with regulated frequency. Ibid.:135-144

Three-phase static frequency converter. Ibid.:177-186

(MIRA 18:10)

SUB CODE: EE
Card 1: 1

L 46777-66 EWT(1)

ACC NR: AR6014547 SOURCE CODE: UR/0196/65/000/011/K007/K007

AUTHOR: Varfolomeyev, G. N.

TITLE: Output-voltage shape in static transistorized frequency converters

SOURCE: Ref. zh. Elektrotekhnika i energetika, Abs. 11K39

REF SOURCE: Nauchn. tr. Omskiy in-t inzh. zh.-d. transp., 1964, no. 46, 27-32

TOPIC TAGS: frequency converter, transistorized frequency converter, frequency conversion

ABSTRACT: Amplifier-stage circuit diagram and topographic voltage diagram are used for developing formulas that describe the output-voltage shapes in a static frequency converter. As the conversion of direct voltage into 3-phase voltage was performed with an intermediate utilization of two 90°-shifted voltages (the Scott circuit), the voltages across the halves of the transformer collector windings are represented by Fourier series. As a result of simple transformations, formulas for the output voltages are obtained. The formulas for the phase voltages of a star-connected induction motor are derived from the topographic voltage diagrams. The above formulas permit predicting the output-voltage shape and the amplitude and phase of each harmonic. Two figures. Bibliography of 1 title. V. Konovalov
[Translation of abstract]

SUB CODE: 09

VARFOLOMEYEV, G.S., gornyy inzh.; KOSSOV, P.A., gornyy inzh.

Intensity of dust formation depending on bore bit design. Gor. zhur. no.9:68-69 S '60. (MIRA 13:9)

1. Berezovskaya opytnaya nauchno-issledovatel'skaya stantsiya Instituta gigiyeny truda i profzabolevaniy AMN SSSR.
(Mine dusts) (Boring machinery)

VARFOLOMEYEV, G.S., gornyy inzh.; KOSSOV, P.A., gornyy inzh.

Measures for keeping dust down more efficiently in wet drilling. (MIRA 15:10)
Sbor. rab. po silik. no.3:47-53 '61.

1. Berezovskaya opytnaya nauchno-issledovatel'skaya stantsiya Instituta gigiyeny truda i professional'nykh zabolevaniy AMN SSSR.
(Boring machines) (Mine dusts)

GALKINA, K.A., kand.med.nauk; TKACHEV, V.V., gornyy inzhener; KOSSOV, P.A.; VARFOLOMEYEV, G.S.; SLUTSKER, A.S.

Effectiveness of settling dust with mist sprayers during blasting operations. Bor'ba s sil. 142-146 '62. (MIRA 16:5)

1. Institut gigiyeny truda i professional'nykh zabolevaniy AMN SSSR.
(Mine dusts—Prevention) (Blasting)

VARFOLOMEYEV, I.A.; SUL'KIN, I.G.; OVCHINNIKOV, G.Ye.

Hoisting block with a rod. Rats. i izobr.predl.v strel.ne.124:24-27
'55. (Hoisting machinery) (MLRA 9:7)

60-29-8/14

AUTHOR: Varfolomeyev, I. A.

TITLE: Methods and Schemes for Checking Galvanometers and Oscillograph Circuits (Metody i skhemy poverki gal'vanometrov i shleyfov dlya ostsillografov)

PERIODICAL: Trudy Geofizicheskogo instituta AN SSSR, 1955, Nr 29, pp. 66-72 (USSR)

ABSTRACT: A method is described for checking galvanometers and circuits for oscillographs which includes the determination of their sensitivity and frequency parameters. A technique is presented for determining the resistance and sensitivity of galvanometers and loops when their internal resistance is unknown. The problems of static sensitivity, resonance frequency, decrement, and coefficient of attenuation in such equipment are discussed. There are 7 figures, 1 table, and 3 references, all USSR.

AVAILABLE: Library of Congress

Card 1/1

ACC NR: AP6034247 (N) SOURCE CODE: UR/0120/66/000/005/0237/0240

AUTHOR: Libin, I. Sh.; Varfolomeyev, L. P.

ORG: VNI Institute of Light Technology, Moscow (VNI svetotekhnicheskiy institut)

TITLE: An instrument for testing of high-speed miniature motors

SOURCE: Pribory i tekhnika eksperimenta, no. 5, 1966, 237-240

TOPIC TAGS: electric motor, magnetic field, electronic measurement, magnetic field measurement, velocity measuring instrument

ABSTRACT: A method used to analyze performance of high speed miniature electric motors is described. The magnetic field surrounding the motor during its operation is sensed, and its ac components corresponding to the instantaneous motor angular velocity n, as well as those corresponding to the slip f-n, where f is line frequency, are isolated and recorded. The field is sensed by a small coil with a ferrite core. The line frequency component f is filtered out by means of an M-derived resonant filter. A low-pass filter is used to suppress the $f+n$ and higher harmonic field components. A special automatically tuned filter separates the f-n and f-$2n$ components. The response of this filter depends on the approximate value of the instantaneous motor velocity. The filtered signals corresponding to n or f-n are detected and the varying dc levels are recorded on an X-Y recorder. An instrument based on these principles was constructed

UDC: 621.317.39:531.7:621.313.13-181.4

Card 1/2

ACC NR: AP6034247

and used to investigate the relations of speed, acceleration, torque and load in small electric motors. The contactless method of measurement is particularly advantageous because of its ease of application, accuracy and flexibility. Orig. art. has: 5 figures.

SUB CODE: 09/ SUBM DATE: 21Oct65/ ORIG REF: 004/ OTH REF: 001

Card 2/2